AMERICAN
DYESTUFF REPORTER

VOLUME XXIII OCTOBER 22, 1934 NUMBER 22

Laboratory Tests for Mildew Resistance of Outdoor Cotton Fabrics

By CHARLES THOM,
Principal Mycologist

HARRY HUMFIELD
Associate Bacteriologist

Division of Soil Microbiology

***and* H. P. HOLMAN**
Senior Chemist

Industrial Farm Products Division, Bureau of Chemistry and Soils

Some of the tests reported in the literature are reviewed. A practical laboratory test for effectiveness of mildew proofing agents applied to cotton fabric is outlined. Results obtained with this test on a number of commercial treatments are given.

LEVINE and Veitch[1] reviewed the subject of mildew resistance of textiles in 1920, proposing a method of testing the relative values of various treatments. This type of work has been continued from time to time in the Bureau of Chemistry and Soils and a further report is now presented.

Mildewing of cotton fabrics appears as development of discolored areas, as destruction of the tensile strength of the fiber, or as both combined. Discoloration may occur without appreciable damage to strength. Fiber deterioration is not necessarily accompanied by discoloration. Both types of damage are attributed to the growth of microorganisms, especially molds or fungi.

Many methods have been proposed to prevent such damage; a considerable number of these proposals use patented or secret procedures. Failures in practical use in the field have continued to be more common than successes in such treatments. There is, therefore, continued need for methods of testing fabrics treated to increase their mildew resistance, to give a comparative estimate of the efficiency of the processes used.

The testing procedures now in use take two general forms: (1) The simulation of the field hazard under conditions more or less closely observed and recorded; (2) accelerated methods in which the natural agents are given what are assumed to be specially favorable conditions to attack the fabric and hence to concentrate into a short period the destructive effects normally extending over long periods. In both types of procedure, after incubation for the time selected, some kind of laboratory examination must be applied to give comparative values to the measurement or the estimation of the stage of deterioration reached. Discoloration is merely a matter of observation. The permanence of discoloration is determined by routine washing and bleaching. Loss of tensile strength is subject to measurement and adequate machinery for the purpose is available. Some of these laboratory procedures will be reviewed.

Microscopic Methods

The Fleming and Thaysen[2] swelling test involves the treatment of affected fiber masses with caustic soda and carbon bisulfide with direct observation under the microscope during the swelling process, making possible an actual count of sound and damaged fibers.

Hall[3] reported a method of staining with "cotton blue" which made it possible to count the mold hyphae present in relation to attacked and unattacked fibers. The hyphae were stained with cotton blue while the fibers were decolorized as the sample was made ready for examination.

Both of these methods involve a microscopic estimate of the extent of damage as seen in slide preparations without furnishing definite measurements of reduced strength.

Field Tests

The practical type of test has usually consisted in the exposure of samples of treated and untreated fabrics to the exigencies of climate and weather for rather long

periods followed by strength tests in the laboratory. Successive results of such exposure are not uniform in any locality. Concordant observations could hardly be expected in widely separated areas in which climatic factors differ. In addition, the time involved is a serious drawback to commercial usefulness in establishing the efficiency of particular processes.

Naturally, a series of procedures designed to hasten the deterioration of such materials were proposed and used by various workers.

Contaminated Moist Chambers

One type of test has been the maintenance of moist chambers contaminated by the introduction of various samples of damaged fabrics. Laboratory incubators have been sometimes used to maintain the temperature and humidity desired. Here again observations continue over considerable periods and there is no standardization of agents of damage or guarantee that successive samples are subjected to a uniform hazard.

Soil Contamination

Searle[4] secured an even distribution of soil upon a "filter candle" by drawing through it a suspension of soil, then while the pump was still working, wrapped the test cloth about the candle, securing intimate contact by the suction. The candle covered by the sample was then incubated in a moist chamber at 30° C. for a definite period, after which the tensile strength of the sample was determined.

Here again there is no way of knowing the species present in the inoculation or of maintaining a known balance of activity among them.

Inoculation With Mixed Cultures

Levine and Veitch[1] prepared a mixture of the organisms isolated from deteriorated fabrics and inoculated disks of cloth placed in petri dishes with this mixture. The dishes were held under known conditions of temperature and humidity. Observations were continued over several weeks or months and the comparative areas of growth developing were used as a basis for estimating the damage from mildewing.

Requirements for Satisfactory Test

Since the most important consideration from the standpoint of serviceability of a fabric is its strength, observation of details of injury and tests of single fibers are not as satisfactory as tensile strength tests on properly selected samples of fresh material compared with similar tests on samples after exposure to mildewing agents. In seeking a basis for an improved procedure, it was realized by the authors that for practical use in determining the mildew resistance of treated fabrics, there is need for a test which can be accurately controlled to give reproducible results. These results should be stated in quantitative, rather than qualitative terms, and should be obtained within a reasonably short time. In order to obtain quantitative results, it was believed that the tests should be made on strips of fabric of definite and uniform width which are tested for tensile strength after being exposed for a definite length of time under definite conditions favoring mildew development, in comparison with controls protected from mildew. The loss in tensile strength, expressed as per cent of original strength, would be a quantitative measure of mildew susceptibility under the conditions used. The smaller this loss, the greater would be the mildew resistance.

Of course, in thus measuring mildew damage, only the deteriorating effect of the organisms upon the strength of the fabric is taken into consideration. Mildew which thrives upon the foreign materials in or upon the fabric and not upon the fiber substance, may have a very damaging effect as regards appearance, but with most fabrics for which mildew-proofing treatments are considered necessary or desirable, the strength of the fabric is more important than appearance, in determining serviceability.

The methods of testing mildew-resistance tried in this Bureau have shown several unsatisfactory features. Even under what were designed to be uniform conditions, results of tests made at different times have not been concordant. No one was sure exactly what biological agent or agents were present or necessary. No two situations were exactly alike. It was also well known that testing procedures at different laboratories or manufacturing plants have yielded similarly unsatisfactory results. It was therefore concluded that the use of mixed cultures should be abandoned because of the difficulties involved in getting comparable results with successive samples. It is recognized that results with a single organism have only limited value but the same condemnation applies to any arbitrary procedure. The choice seems to lie between a sharply standardized test and the actual judgment of exposure in the field, which is costly in time, without always being satisfactory. As a relative measure of the protection afforded by a proposed treatment, the results thus far appear to favor a standardized method, using a single test organism in pure culture. The first task, then, called for the selection of a test organism.

Selection of Organism

The fungi found upon raw cotton and cotton fabrics have been extensively studied. A whole series of papers listing and describing the organisms found have appeared in the Journal of the Textile Institute and elsewhere. Thaysen and Bunker[5] reviewed this literature down to 1927.

Cultures from apparently sound fabrics show many viable organisms present as contaminants either in the resting condition or failing to produce noticeable damage. When rotten fabric is examined, the list comes to include any organism which can survive in the dirt or filth with which such fabric is commonly smeared. Adequate correlations between presence and significant activity of particular species are not available although lists of species found to decompose cellulose have been offered from time to time.

The organism to be used in an accelerated test for mildew-resistance must be capable of rapid destruction of cotton fabric; it must be easy to cultivate; it must be adaptable to a fairly wide range of conditions; it must be easy to identify in order to maintain in pure culture or to free from contamination.

The literature on mildew of cotton and on cellulose decomposition pointed to certain species of bacteria and molds. From the mold collection available, certain of these species were selected and inoculated upon strips of canvas in separate containers. *Cytophaga* was isolated locally and added to the list of organisms tried. Table I presents the results of some of these tests.

Cytophaga

In this series of experiments, *Cytophaga* was the most active agent found. The organism, however, proved difficult to purify and difficult to handle without subsequent contamination. It proved so exacting in its demands upon conditions of growth and maintenance in culture as to require the attention of an experienced bacteriologist at all times. For general use, therefore, it could hardly be recommended.

Chaetomium

Of the other organisms tabulated *Chaetomium globosum* (identified by Prof. A. H. Chivers[6] was almost twice as destructive as the next most active mold, *Penicillium luteum*. *Chaetomium* has been listed by Galloway[7], by See[8], by Thaysen and Bunker[5] and by others, among the cellulose destroyers without particular emphasis upon its practical importance.

When test samples of cloth were placed upon a medium which supplied all the necessary nutrients except carbon, *Chaetomium* was found to be present upon series of samples of rotting fabric from widely separate sources. It was present even in the test incubator of the laboratory by natural inoculation. It has thus been shown that *Chaetomium* is a common cause of destruction of awnings, paulins, bags, shock covers, and tentage in the field.

Further tests of this organism confirmed previous workers in demonstrating rapid cellulose dissolving power. Tests on strips of canvas under optimum conditions proved it capable of rotting cotton duck until it could be torn into bits with the fingers within a month. Comparative tests with the molds most nearly approaching the efficiency of *Chaetomium* in the early laboratory tests confirmed the selection of this strain of *Chaetomium globosum* as a favorable test organism. Then a series of strains and species of *Chaetomium* were collected and tested, (see Table 2). Again the strain of *C. globosum* already in use proved to be the most active. Whether a strain more favorable for the purpose may eventually be found is problematical. This seems adequate for the present purpose.

In developing Table 2, untreated 8 oz. Army duck was used. The laboratory procedure to be described later was followed. The table gives the tensile strength before and after 14 days incubation. All other strains of *Chaetomium*

Table 2

Effect of Different Species of Chaetomium on the Tensile Strength of Cotton Duck, After Inoculation and Incubation for 14 Days

	Kgm. pull required to break strips 1-inch wide					
Sterile fabric	*Ch. globosum*	*Ch. cochliodes*	*Ch. funiculum*	*Ch. ....*	*Ch. ....*	*Ch. aureum*
58.2	2.8	5.4	5.2	13.4	12.2	5.9
61.5	3.5	3.8	7.4	23.6	5.8	7.7
58.3	3.8	5.4	6.7	18.9	13.3	7.0
56.6	2.7	7.2	5.3	16.8	6.2	5.3
57.6	...	5.8	5.6	12.2	4.9	8.9
Av. 58.5	3.2	5.5	6.0	17.0	8.5	7.0
Per cent loss	94.5	91.6	89.7	70.9	85.5	88.0

Table 1

Effect of certain microorganisms on the tensile strength of cotton duck subjected to different treatments

Organism	*Period of Incubation Weeks*	*Culture Solution*	*Breaking Points of Strips 1-inch Wide* — *Treatment* — *Untreated Kgm.*	*Mineral Khaki Kgm.*	*Cupram-monium Kgm.*	*Zinc borate Kgm.*
Sterile	3	Inorganic salts	76.0	62.0	50.0	77.8
Spirochaeta cytophaga	3	Inorganic salts	0.2	0.2	41.8	0.2
Sterile	7	Czapek nutrient	69.4	67.6	40.4	70.3
Aspergillus cellulosae	7	Czapek nutrient	67.7	65.1	43.8	76.2
Fusarium sp.	7	Czapek nutrient	71.3	66.6	42.1	69.2
Aspergillus terreus	7	Czapek nutrient	60.0	65.0	41.6	67.6
Stachybotrys sp.	7	Czapek nutrient	44.0	49.3	39.8	36.1
Chaetomium sp.	7	Czapek nutrient	27.6	29.9	41.5	55.1
Trichoderma sp.	7	Czapek nutrient	57.7	63.0	43.7	46.0
Penicillium luteum	7	Czapek nutrient	40.3	50.4	38.8	46.3
Penicillium luteum	6	Soil extract + 3% sugar	47.4	63.0	43.5	76.6
Helminthosporium sp.	6	Soil extract + 3% sugar	69.5	62.0	42.4	80.7
Trichoderma sp.	6	Soil extract + 3% sugar	69.7	68.3	44.1	81.6
Chaetomium sp.	6	Soil extract + 3% sugar	62.5	61.0	44.8	79.8
Penicillium luteum	6	Soil extract	51.8	55.7	45.1	80.7
Helminthosporium sp.	6	Soil extract	66.0	60.6	44.4	75.6
Trichoderma sp.	6	Soil extract	75.6	60.0	43.0	74.6
Chaetomium sp.	6	Soil extract	59.1	59.8	43.2	74.4

tested were found to be rapid destroyers of fiber although the original strain of *C. globosum* was slightly the most effective. The routine procedure which follows is based upon our experience in using this organism.

Proposed Procedure

The test sample should consist of one or more pieces of the fabric, long enough to cut test strips at least 4 inches long in the warp direction and broad enough to repeat the test once at least, if check examination is called for. Several pieces will ensure more representative sampling if there is controversy. Preliminary to testing, the sample should be soaked in several changes of water or in running water for two days in order to remove water-soluble antiseptics which could easily be leached out by rain on exposure to the weather.

Test Strips

Not less than 12 strips 4 x 1¼ inches should be cut from the air-dried test sample in the warp direction.

Control Series

Five strips should be placed in an empty vessel which will stand sterilization in steam. A bottle 5 inches high by 2 inches square at the base with opening 1¼ inches in diameter and covered with a screw cap loosely placed over the opening permits the entrance of steam sufficiently freely.

Test Series

Not less than 7 strips for test should be prepared in a duplicate container.

Sterilization

Both containers should be sterilized in an autoclave at 15 lbs. pressure for 30 minutes.

Culture Medium

For making the test with this *Chaetomium*, a culture medium with the following composition is recommended:

Distilled water	1,000 ml.
$NaNO_3$	3 grams
KH_2PO_4	0.25 grams
KCl	0.25 grams
$FeSO_4$	0.01 grams
Agar	4.00 grams

Adjust to pH 6.8

Melt in the autoclave at 15 lbs. pressure.

Distribute into bottles or flasks of about 100 cc. each, close with cotton plug or other satisfactory closing device and

Sterilize in the autoclave at 15 lbs. pressure for 20 minutes.

It will be noted that no source of assimilable carbon is introduced into the basal medium. The organism is left to obtain its energy material by attacking the cellulosic material furnished by the sample.

Petri dishes 120 mm. in diameter and 1 mm. deep should be dry-sterilized at 200° C. for three hours.

Seven sterile dishes are required for each sample to be tested.

One bottle (100 cc.) of medium should be melted for each sample to be tested; the agar is poured into the petri dishes in a layer about 3 mm. thick and allowed to solidify.

Inoculum

A suspension of spores of *Chaetomium* is prepared by the usual procedure of a bacteriological laboratory which may be simplified as follows: Keep on hand stock cultures in test tubes with *Chaetomium* in ripe fruiting condition. In this condition they remain viable for several months at least. Pipette into a culture tube about 10 cc. of sterile water and shake vigorously to bring the ascospores into suspension. Use each culture just once and discard.

Inoculation

Alternative A. With a sterile pipette, transfer 10 cc. of the spore suspension (inoculum) to the container carrying the test slips and shake thoroughly. Then with a sterile (flamed) forceps remove the test slips one by one and drop them upon the surface of the solidified agar in the petri dishes. All of the precautions usually required in bacterial or mold culture work should be taken to avoid contamination.

Alternative B. With a sterile 1 cc. pipette, transfer 1 cc. of the spore suspension to the surface of the agar in each petri dish; tilt the petri dish until it is distributed evenly; then with sterile forceps place a test strip in each dish.

Incubate at 28-30°C. for 14 days.

At the end of the incubation period the strips should be more or less evenly covered with a gray green tufted growth of mold. The five strips most evenly covered with mold should be selected, washed free of agar and visible mold and air dried. These strips, together with the five controls, should then be carefully ravelled down to a definite number of threads, corresponding to one inch of the original fabric. A thread counter is almost indispensable in adjusting all strips to the same number of threads. Simple measurement with a ruler can not be depended upon since the wetting and sterilizing treatments to which the fabric is subjected result in a variable degree of shrinkage.

Tensile Strength

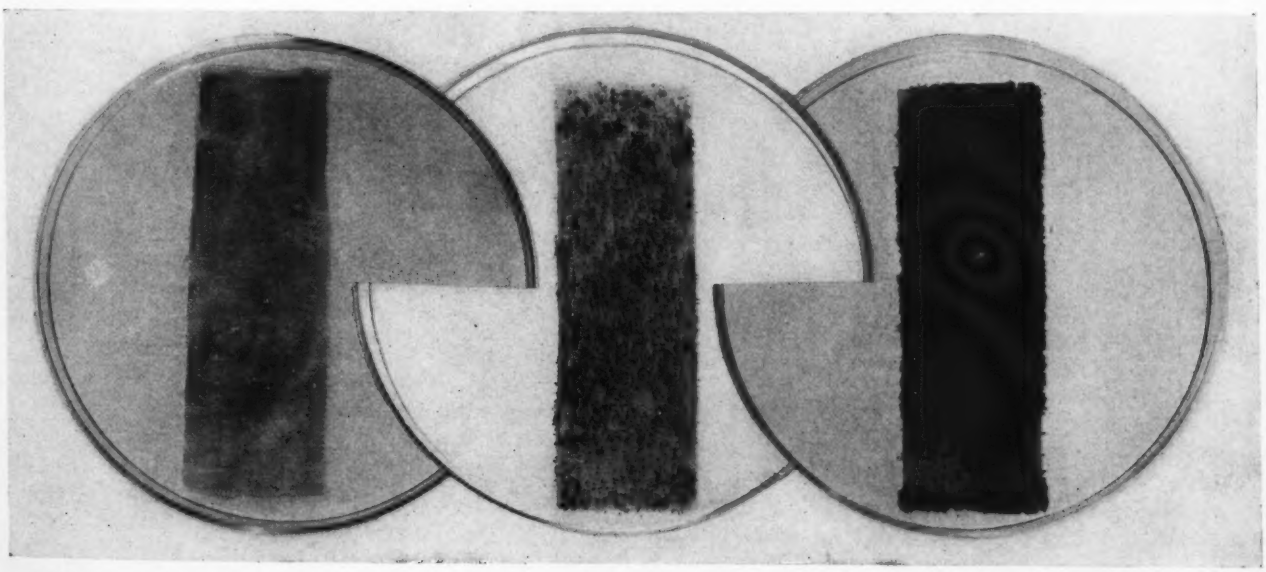
In order to compare results of tests made at different times it is advisable to expose the test strips to standard conditions in a constant temperature and humidity room for 2 days or more before testing. Each strip is clamped into a standard tensile strength testing machine and the weight necessary to break it is recorded. In this way five control figures are obtained to average and compare with the figures from five strips exposed to the organism for 14 days. The results are averaged and the loss of tensile strength calculated as per cent of average tensile strength of controls.

The results obtained by the application of the method to a series of commercial samples are presented as Table 3.

Table 3

Effect of Mildew upon Tensile Strength of Cotton Duck After Inoculating with Chaetomium globosum and Incubating for 14 Days

Fabric	Treatment	Tensile Strength: Sterile Kgm.	Tensile Strength: Inoculated Kgm.	Per cent loss
Army duck, 10 oz. gray, untreated		59.6	2.0	
		58.4	5.6	
		55.8	10.4	
		55.2	4.0	
		62.4	2.7	
		Ave. 58.3	5.0	91.4
Army duck, 10 oz. gray, impregnated	Commercial treatment "B"	55.2	1.1	
		56.4	1.4	
		58.4	2.0	
		56.4	1.8	
		56.2	1.6	
		Ave. 58.5	1.6	97.2
Army duck, 10 oz. gray, impregnated	Commercial treatment "C"	51.2	2.0	
		49.0	3.2	
		52.6	3.8	
		45.0	7.2	
		50.0	4.6	
		Ave. 49.6	4.2	91.5
Army duck, 10 oz. olive drab, sulfur dyed, impregnated	Commercial treatment "C"	66.2	61.0	
		63.6	64.6	
		60.6	57.8	
		60.0	54.4	
		64.8	60.6	
		Ave. 63.0	59.7	5.2
Awning duck, woven stripe, green and white, impregnated	Commercial treatment "D"	64.4	3.4	
		63.6	4.8	
		60.0	3.8	
		65.6	7.2	
		65.8	3.4	
		Ave. 63.9	4.5	92.9
Awning duck, duplex coated, orange and green	Commercial treatment "E"	62.6	46.4	
		55.6	33.8	
		58.6	52.8	
		59.6	58.4	
		60.8	51.2	
		Ave. 59.4	52.5	11.6
Army duck, medium weight, impregnated and coated, green	Commercial treatment "F"	70.6	66.4	
		71.6	67.8	
		67.6	68.6	
		72.2	66.4	
		71.4	68.8	
		Ave. 70.7	67.6	4.3
Army duck, medium weight, impregnated and coated, brown	Commercial treatment "F"	87.6	85.0	
		80.0	81.0	
		95.0	87.6	
		89.8	90.0	
		93.8	92.0	
		Ave. 89.2	87.1	2.3
Cotton duck, No. 3, gray, impregnated	Commercial treatment "G"	55.4	3.4	
		62.2	3.2	
		58.8	1.8	
		52.0	2.0	
		55.6	2.0	
		Ave. 56.8	2.5	95.6
Cotton duck, No. 10, brown, impregnated	Commercial treatment "H"	80.6	84.8	
		76.2	80.0	
		88.0	89.6	
		86.8	88.8	
		79.8	88.6	
		Ave. 82.3	86.4	0.0



A B C

Figure 1

Instead of giving only averages, the result of each test appears in this table. It will be noted that among five sterile strips the deviation from the average is rarely greater than 5% In the mildewed strips, there is much greater variation occasionally. Mold growth rarely spreads evenly.

The accompanying illustrations show in Figure 1, a strip of untreated fabric (A) before incubation, (B) after one week incubation and (C) after two weeks incubation. It will be noted that a heavy and characteristic sporulation occurs only on the material and not on the substrate. Figure 2 shows the appearance of the spore growth under a low power microscope, magnification 10x.

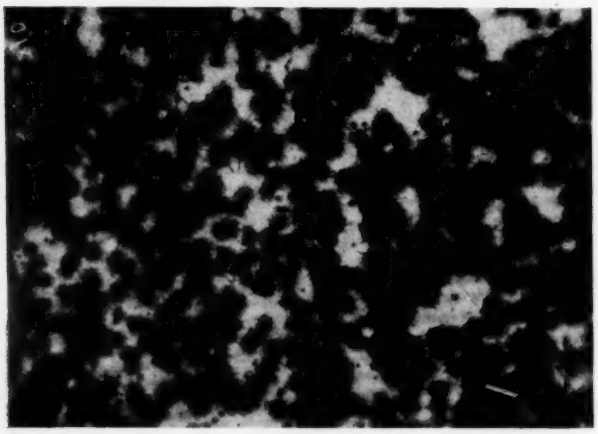


Figure 2

Figure 3 gives a sideview of a single perithecium, magnification 120x.

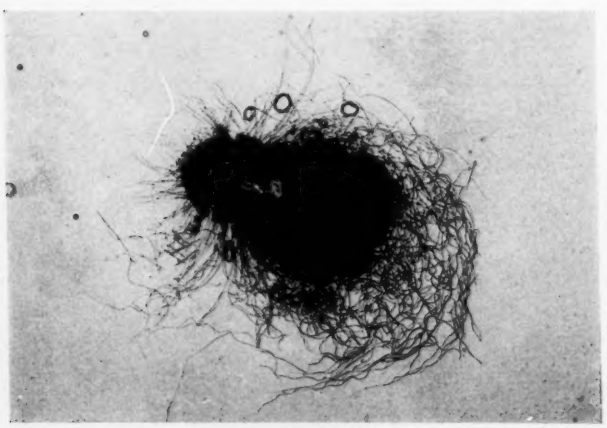


Figure 3

Summary

After experimenting with various organisms known to have the ability to destroy cellulose, a strain of *Chaetomium globosum* was selected as the most satisfactory one for use in testing the mildew resistance of treated fabrics for outdoor use.

The authors recommended a laboratory test for mildew resistance including the following steps: Inoculation of strips of fabric, previously soaked in water and sterilized, with a pure culture of *Chaetomium globosum;* incubation for 14 days in petri dishes on agar jelly containing mineral nutrient; washing and drying; and testing the strips for tensile strength in comparison with sterilized controls, after reducing to a predetermined number of threads, equivalent to 1 inch of the original fabric) and conditioning in a constant temperature and humidity room.

Tests in quintuplicate on untreated and treated cotton duck, using the proposed procedure, gave consistent results.

REFERENCES

[1]Levine and Veitch: Ind. Eng. Chem., 12, 139-145 (1920).
[2]Fleming and Thaysen: Biochem. J. 14, 25 (1920).
[3]Hall: Am. Dyest. Rep., 19, 663 (1930).
[4]Searle: J. Text. Inst., 20, 163 (1929).
[5]Chivers: Memoirs of the Torrey Botanical Club, 14, 155-240 (1915).
[6]Galloway: Text. Inst., 21, 277 (1930).
[7]See: "Les maladies du papier pique," Paris (1919).
[8]Thaysen and Bunker: "The Microbiology of Cellulose, Hemicelluloses, Pectin and Gums." London (1927).

● GLYCERINE PRODUCTION

Larger domestic production and heavier imports of glycerine since the beginning of 1934 reflect increased activity among the numerous industries in the United States which use this material, according to C. C. Concannon, Chief of the Commerce Department's Chemical Division.

Production of all grades of glycerine during the first half of 1934 increased almost 50 per cent to 143,000,000 pounds compared with the corresponding period of last year and represents the first general increase in recent years. Glycerine of 80 per cent basis, ranked first in production and increased 55 per cent to 79,000,000 pounds and was followed by "chemically pure" glycerine which increased 77 per cent to 41,000,000 pounds, and grades used chiefly in the manufacture of industrial and other explosives which increased 32 per cent to 23,000,000 pounds compared with the corresponding period of 1933.

Notwithstanding this large gain in production United States imports of crude glycerine during the first eight months of 1934 increased 133 per cent to approximately 11,000,000 pounds, valued at $728,600, compared with the corresponding 1933 period, Mr. Concannon stated. Imports of refined glycerine declined 40 per cent in quantity to 1,409,500 pounds but the value advanced slightly to $132,750.

Glycerine, a by-product of soap manufacturing, has wide use in industry, particularly in explosives, medicinal, and cosmetic fields. Large quantities are also used in anti-freeze solutions, inks, liquid soaps, and the manufacture of plastics, tobacco, and a score of other products.

The last census of manufactures shows a total of 48 plants producing glycerine in the United States, 38 of which are east of the Mississippi river. Ohio leads with 9 plants followed by New Jersey and New York with 6 each, California and Massachusetts with 5 each, and Illinois and Pennsylvania with 3 each.

Washington News Letter

By **WALDON FAWCETT**

PRE-SESSION Congressional activities for the 74th Congress will, of necessity, start promptly after the November elections. The change from the former deliberate preparatory routine is due to the short span allowed for the organization of a new Congress. Under the old system, members elected in November did not assemble until December of the following year, unless called in special session. By the new routine, the personnel chosen in November goes into action early in January. This means that the closing weeks of 1934 will witness the prolonged hearings incident to the casting up of the departmental appropriations for the fiscal year beginning July 1, 1935. And, what is equally important to dye and textile interests, the realignment of the committees of the Senate and House of Representatives, where the formulation of Congressional policies takes place.

The Latest Choice for Color Visibility

An authoritative verdict on color visibility is found in the recent official choice of Galatea Orange as best meeting the severe exactions in the field of aeronautics. By order of the Bureau of Air Commerce of the U. S. Department of Commerce, the official color plan to be used on its official airplanes will henceforth comprise Galatea Orange in combination with black. The colors formerly used, and now supplanted, were maroon, international orange, black and aluminum. As a result of thorough tests, the department specialists concluded that the Galatea tint, which verges more on the brownish than some of the other shades of orange, has the highest "distance value." Considerations which also weighed in the revision of color choice were the circumstances that the newly-chosen colors are less expensive and simpler to maintain; more easily matched; and will actually weigh less when spread on the surfaces of an airplane.

Some curiosity has been manifested as to why the Bureau of Air Commerce should have switched from International Orange, a color very similar in color to the Galatea,—the International having been in use for more than two years on beacon lights and radio towers and on the Department of Commerce intermediate field corner-markers. The deliberate conclusion was that the substitute orange now approved provides a glossier finish and is more readily distinguishable in the air. The order affecting the Commerce airplanes does not, of course, affect private or commercial planes, nor the markings for airports. The expectation is, though, that in view of the very definite results obtained in the tests, a trend to Galatea Orange in all quarters may be expected.

Dyes Needed for Commodity Color Clues

There has developed latterly a more sharply defined trend in the identification of manufactured articles which bids fair to make itself felt in dyestuff demand. The new manifestation may be described as a mass use of color in trade-marking. From the earliest days of merchandise branding there has been a measure of employment of color in distinguishing the origin or ownership of commodities. For the most part, however, this earlier use of color has consisted in a color rendering of typography or pictorial elements,—say, representations in color of symbols such as stars, diamonds, crescents, circles, etc. Needless to say, this restrained use of color could not be readily defined as a factor in dyestuff consumption.

Somewhat different is the prospect growing out of the mass use of color. The essence of the new idea of color application for the sake of authentication is that branding shall be accomplished, not by the application of a name plate, stamp or label (in color or otherwise) but by means of the coloring of the article itself or an important component part. In many instances a conspicuous structural feature is chosen to bear the color clue. This practice is well illustrated currently in the fields of tools and machinery where hammer heads, implement handles, metal bands, etc., have been drafted as vehicles of individualistic coloring. The ends of the dyestuff industry in this environment are served by the circumstance that the U. S. Patent Office, which supervises trade-mark practice, is insistent that commodity coloring, in order to enjoy a protectable or exclusive status, shall be of a nature clearly indicative of a sole purpose of identification and not in any degree a conventional coloring commonly applied, or likely to be so applied throughout the industry, for preservative purposes or other utilitarian functions.

Challenge to the Geographical Element in Textile Marking

Decision has just been reached by Biltmore Industries, Inc., of Asheville, N. C., to carry to the highest Federal Court an appeal against the refusal at the Department of Commerce to sanction by registration the use of "Biltmore" as a fabric brand. The test case takes on interest for the industry at large because it joins, with singular directness, the issue of the right of a producer to employ

a geographic, or geographically-suggestive name as a trade-mark for a textile line.

The rights of individual concerns to the use of place-names on products reminiscent of particular places presents one of the most difficult foggy spots in the entire trade-mark system. There is, at the U. S. Patent Office, a broad prohibition upon monopolies in the use of geographical names, just as there is a basic ban on descriptive words. But the reservation "merely" is interposed. Which joker means that the taboo is on geographical names which are *only* or *solely* geographical. A suggestive name of geographical flavor, which transcends downright specification of a given spot on the map, is allowable.

Rejecting the application of Biltmore Industries, the Commissioner of Patents ruled that the term was merely geographical because the plant was located at Biltmore, N. C., at the time of the adoption of the mark and that fact was the sole reason of the weaving firm for using the mark at all. He was further moved to rejection by the fact that the geographical term comprised the entire mark, devoid of any incidental unique features. Incidentally, the Federal censor found fault with the ownership qualifications of Biltmore Industries, because, at the outset the brand "Biltmore" was used only on packages as a return address, etc., rather than given obvious employment as a trade-mark directly on the goods or in intimate association.

In carrying their case to the U. S. Court of Patent Appeals, Biltmore Industries will urge, for one thing, that "Biltmore" is entitled to the exemption which tradition has established for geographical terms that are not prominent nor well known. And which indulgence has allowed the registration of names such as "Solvay," "Lakeside," "Shasta," "Everest," "Royston," etc. The protestants will further put forward the theory that a textile trade-name may, through use, acquire a commercial significance and meaning that far overshadow any geographical meaning the name ever had, even if a post office and a railway station be designated by the name in question.

American Hand-Weavers Capitalize Color

One of the surprising consequences of the present currency situation, and its disturbance of international exchange, is to be found in the stimulus imparted to the American hand-woven textile industry. With the dollar at a discount, in most foreign markets, there has been a sharp falling off in the importation of homespun tweeds and like fabrics from Ireland, Scotland, the Scandanavian countries. In proportion there has developed a mounting demand for the product of American hand-looms, operated by firms with an established reputation for sustained quality of product. Some of these establishments, with say, ten to twenty looms in operation, have attained, this past few months, the highest turnover reached in five years or more. From a preponderance of production in upholstery fabrics, and specialties, such as mufflers, the major output is swinging to apparel fabrics, as a number of the leading producers of men's and women's wear turn to the domestic sources for the hand-woven materials formerly obtained in the United Kingdom, the Irish Fresh State or on the Continent.

From the standpoint of the dyestuffs industry, the most interesting aspect of this evolution grows out of the deepened ambitions which leading American hand-weavers have nurtured as a result of the quickened demand. For several years past, there has been, on the part of the more progressive hand-weavers, a consistent effort to raise the standards of quality in the hand-woven branch of the industry and to maintain uniformity in the quality of the products. Coincident with this effort has appeared a deepened style-consciousness on the part of the weavers catering to discriminating trade and the utmost effort to capitalize colors in the hand-woven fabrics. As an example of this last there might be cited the featuring of the blues which has been a characteristic of this program and which has won to the hand-woven group a class of trade that never showed any weakness for the heather mixtures, etc.

But lately, as the complement of the above, the hand-weavers, encouraged by the new-found volume demand, have entered upon a campaign of education to sell the ideal of higher standards to consumers. What is particularly sought, in this quietly-conducted drive, is to persuade the consuming public to a realistic analysis of the legends "Hand-Woven" and "Vegetable Dyed." The crusaders would awaken consumers to the fact that, under existing competitive conditions, the specification "Hand Woven" is not to be blindly accepted as a guaranty of a fixed, presumptive standard of quality. As an insurance against a hazard to good will, due to popular jumps to this conclusion, the plan seeks to render customers sensitive to trade marks and to induce selection on brand rather than blanket assumption of integrity in "Hand Woven".

The other half of the dual campaign of education presents even greater difficulties. From the inception of the movement for the revival of the handicrafts in the United States,—particularly in the Southern mountains and other primitive localities—there has been a propensity on the part of promoters to glorify vegetable-dyed products. This propaganda has nurtured among customers an obsession which the leading hand weavers are convinced may prove a detriment to the industry. These master weavers, almost without exception, make no pretentions to dyeing operations at first hand, nor restriction to the storied native herbs, etc., but purchase their yarns from supply houses that undertake dyeing responsibilities under the most rigid specifications. They hold that not only is professional service requisite to colors in keeping with the standards set for their products but that many of the latter-day examples of hand dyeing, at

(Continued on page 590)

General

Dyeing and Finishing†

Instructions For Bemberg* Knitted Fabrics

By **ERNEST H. BENZING**
American Bemberg Corp.

BEMBERG yarn is delivered prepared (oiled) and therefore possesses suppleness sufficient for the usual requirements of the knitting process. Further preliminary treatment by the manufacturer is unnecessary. If, however, for any reason, a second preparation is considered advisable, use a sulfonated oil. This preparation is easily removed in the scouring operation.

Scouring

Due to variations from plant to plant in local conditions, as well as variations in the fabric processes and in results desired, it is not practicable for all plants to use the same scouring procedure, nor will the same procedure work equally well in all plants.

Scouring Formula

2% to 4% Neutral Soap)
) to a litre
1% to 2% Ammonia)
starting cold, then bringing to boil,
boiling for 30 minutes.

Mills having hard water should use tri-sodium phosphate; mills having fair to good water usually use soda ash. The following scouring ingredients obtain good results:

2% to 3% soda ash or tri-sodium phosphate
2% to 4% soap
2 pounds soluble pine oil or a similar product.
Boil 30 minutes.

To produce the finished product at lowest cost for dyeing and finishing operations, fabrics are today generally dyed in the boiling-off bath. This method can be used successfully for medium and dark colors, but is not recommended for light shades due to the presence of large quantities of oil in knitting.

Bleaching

Bemberg is a naturally white yarn and therefore does not require bleaching. If, however, stockings of Bemberg yarn have welt, toe or heels made of unbleached cotton which must be subjected to a bleaching process—bleaching may be desirable, particularly to obtain a uniform shade in the dyeing of white or delicate colors. For this purpose, the following procedure has been used successfully by mills to obtain best results at minimum risk of tendered fabric.

Scour as usual, rinse well. Bleaching at room temperature with a chlorine solution of ½° Baume for 30 minutes, or until the required effect is reached. After bleaching the goods are rinsed, acidified with sulfuric acid, treated with sodium bisulfite, rinsed, soaped, and dyed.

A light bleach in the scouring bath is obtained by using a formula similar to the following:

2% olive oil soap chips
½% sodium perborate
2% Pine Oil scouring oil
at 160° Fahrenheit for 1 hour

Dyeing

Direct dyestuffs produce very good results on Bemberg, the reaction being similar to that of cotton or rayon goods.

Bemberg yarn has a high affinity for all direct dyestuffs. The yarn readily takes the dyestuff cold, the capacity of absorbing the dyestuff increasing up to 160° Fahrenheit. Above this temperature the dyestuff begins to leave the fiber to a certain extent, which aids in leveling the shade. It is desirable, therefore, that the dyestuff be taken on as slowly as possible in the beginning and that the bath be close to boiling during the dyeing. Dyeing is accomplished while the bath is hot. The goods may be dyed in the scour or boil-off at near boiling point. The dyestuff should be added slowly in two or three parts, the bath kept at the boil during dyeing.

If necessary to use a two-bath method for scouring and dyeing, it is best to dye the stockings in a neutral soap containing 2% to 4% soap or preferably 2% of a high grade sulfonated olive oil, because this assures penetration of the dyestuff at the seams. For hard water, soda ash may be used with the bath. Use little or no salt. Glauber salt is not necessary to drive dyestuff on Bemberg. Dark shades are sometimes dyed with developed

*"Bemberg" is the trade-mark of the American Bemberg Corporation, registered in the U. S. Patent Office, to designate its yarn made from dissolved cellulose fibers spun into very fine filaments by an exclusive stretch-spinning cuprammonium process.

†This is the first of a series of articles submitted by members of the Rayon Sub-Committee of the A. A. T. C. C.

colors because of their greater fastness to laundering, or such dyestuffs may be used as can be after-treated with formaldehyde.

As Bemberg yarn has a higher affinity for direct colors than cotton, it is likely to come out darker in dyeing than cotton used in welt or foot. Attention must be given, therefore, to equal dyeing of both fibers by use of the method herein described and proper dyestuffs (which can be obtained through application to your dye supply firm). Proper penetration of the dyestuff at the seams and matching of shades on the cotton and Bemberg yarn is obtained by extended boiling. The best match is possible when high grade mercerized cotton is used.

Finishing

After dyeing, the goods are properly rinsed and finished. For soft goods without scroop a bath containing 3% of sulfonated olive oil or a similar softening product is used. If scroop is desired, the goods are given a light soap bath and then a fresh bath. Add 1% to 2% tartaric or lactic acid and treat goods ten minutes in this bath.

It is also suggested that a small percentage of glycerine be added to the finishing oil used. In this way the pieces will not have too dry a feel, as a slight amount of moisture in the pieces will improve the finish. The goods should not be dried at too high a temperature. Hosiery should not be boarded too wet or at excessive heat as this would result in a harsh finish.

Fabrics Made of "Matesa" Bemberg Yarn

Fabrics made of "Matesa" yarn may be treated in the same general way as those made of standard Bemberg yarns. "Matesa," however, does not have as great an affinity for dyestuff as the standard or regular yarn and in some cases Glauber salt may be necessary.

Mixed Fabrics

Bemberg and acetate—Bemberg to be dyed, acetate to remain white—. The degree of pure whiteness obtainable depends not only upon the dyestuffs and the depth of shades to which the Bemberg is to be dyed, but also upon the quality of the acetate itself. To insure best whiteness, fast to washing, in mixed fabrics where Bemberg has been dyed in dark colors, use developed colors.

With direct dyestuffs, the fabrics are dyed for ½ an hour to 1 hour at 170° Fahrenheit with the addition of 5-30% calcined Glauber salt. Additions of alkalis, such as soda, etc., must be avoided.

NOTE: *Information given is general, as no fixed rules can be made to apply to all dyeing establishments.*

WASHINGTON NEWS LETTER

(Continued from page 588)

the hands of hit-and-miss experimenters are calculated to do actual harm to the reputation of hand-woven fabrics as a class.

By virtue of the direct contacts which the more prominent hand weavers maintain with a large proportion of their customers, it is accounted feasible to puncture the fallacy that there is any magic in the term "vegetable-dyed". Or in "native-dyed", or any of the alternative boasts. Especially will it be made clear that dyeing out of doors over a wood fire,—employing the utmost resources of flowers, berries, barks and roots,—could never produce some of the colors which have become, latterly, the pride of the hand weaving industry and are in large measure responsible for the wider acceptance of the hand-loomed fabrics. Incidentally, it is noted that, even in the Southern Appalachians, there is, today, nothing approaching 100 per cent dependence upon "native" dyes. Conspicuous exceptions include Madras Indigo for blues, Madder from Belgium for red and Cudbear from Scotland for purple.

● CARBIC COLORS

The Carbic Color & Chemical Co. has sent out pamphlets on two new colors. Copies of these circulars are available on request.

Indigosol Printing Violet I R R—said to be a very stable and easily soluble vat product which gives good reddish violet shades on cotton, rayon and mixed fabrics. These shades are said to possess good fastness to light, washing and chlorine. This product can be used for direct prints and padded resist styles.

Indigosol Violet A R R—a new member of the Indigosol range which is said to yield on vegetable fibers as well as on rayon beautiful reddish violet shades of good fastness properties and excellent levelling and penetrating power. Because of these properties it is recommended by the distributors for the production of pale shades on piece goods, especially fine threaded mercerized material.

Annual Meeting and Convention
American Association of Textile Chemists and Colorists
December 7th and 8th
Hotel New Yorker **New York City**

PROCEEDINGS OF THE
American Association of Textile Chemists and Colorists

October 22, 1934

Officers of the Association

ROBERT E. ROSE, *President*
E. I. Du Pont de Nemours & Co., Wilmington, Del.

A. R. THOMPSON, Jr.—ALEX MORRISON, *Vice-Presidents*

WILLIAM R. MOORHOUSE, *Treasurer*
National Aniline & Chemical Co., Boston, Mass.

HAROLD C. CHAPIN, *Secretary*
Lowell Textile Institute, Lowell, Mass.

LOUIS A. OLNEY,
President Emeritus and Chairman of the Research Committee
Lowell Textile Institute, Lowell, Mass.

Councilors-at-Large

JOSEPH F. X. HAROLD — **WILLIAM D. APPEL**
DONALD H. POWERS — **HUGH CHRISTISON**
CARL Z. DRAVES — **WALTER M. SCOTT**

Councilors Representing Sections

HEYWARD F. LAWTON (Rhode Island) — **EUGENE C. KNAEBLE** (Philadelphia)
HANS MEYER (New York) — **CARL E. BICK** (Midwest)
ROLAND E. DERBY (N. New England) — **G. H. DUBOIS** (South Central)

Local Sections and Their Officers

Northern New England Section
Roland E. Derby, Chairman, M. T. Stevens Co., No. Andover, Mass.
Clarence L. Nutting, Secretary, Arlington Mills, Lawrence, Mass.

Rhode Island Section
John G. Masson, Chairman, Rosemont Mill, Woonsocket, R. I.
Raymond A. Pingree, Secretary, 7 Sayles Ave., Saylesville, R. I.

New York Section
Ephraim Freedman, Chairman, Bureau of Standards, R. H. Macy & Co., Broadway and 34th St., New York, N. Y.
P. J. Kennedy, Secretary, E. I. duPont deNemours & Co., Inc., 61 Thomas St., New York, N. Y.

Philadelphia Section
Robert A. Bruce, Globe Dye Works, Kinsey & Worth Sts., Philadelphia, Pa.
Charles A. Seibert, Secretary, 39 Chestnut St., Salem, N. J.

Piedmont Section
George P. Feindel, Chairman, Union Bleachery, Greenville, S. C.
John C. Robertson, Secretary, E. I. duPont deNemours & Co., 5 Pettigru St., Greenville, S. C.

South Central Section
Harold Schroeder, Chairman, Dixie Mercerizing Co., Chattanooga, Tenn.
Harvie Bruce Kimbrell, Secretary, Dixie Mercerizing Co., Chattanooga, Tenn.

Midwest Section
Eric F. Hempel, Chairman, National Knitting Co., 2165 South First Street. Milwaukee, Wis.
Elmer F. Smith, Secretary, American Aniline Products, Inc., 820 S. Clinton St., Chicago, Ill.

South-Eastern Section
Charles B. Ordway, Chairman, Alabama Polytechnic Institute, Auburn, Ala.
C. A. Jones, Secretary, Georgia School of Technology, Atlanta, Ga.

Lowell Textile Institute Student Section
Kenneth E. Leslie, Chairman; Chester M. Kopatch, Secretary

North Carolina State College Student Section
H. S. Bliven, Chairman; D. B. Hardin, Secretary.

Members should notify the **Secretary** immediately of all address changes

1933 YEAR BOOKS

DLT
3.00 pd
Howes
660.6
A49 1930

The 1933 Year Books were mailed to members by the Howes Publishing Co. in September. If you have not received your copy, please notify the Secretary of the Association, Dr. H. C. Chapin, Lowell Textile Institute, Lowell, Mass. Additional copies may be obtained from the Secretary for $3.00 plus postage. Postage is 11c in the Boston zone and proportionate elsewhere.

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the secretary any vacancies which may occur in their businesses.—H. C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive

Note. Persons who have obtained employment should notify the secretary at once. Prospective employers may file vacancies either with the secretary or the American Dyestuff Reporter.

A-2

Education—B.T.C., Lowell Textile Institute, 1932; also course in typing.

Experience—None to date, interested in quantitative analysis, experimental dyeing, color matching, dye testing and dye identification. Ability to learn quickly and will go anywhere. 23 years old, woman, single.

A-5

Education—B.T.C., Lowell Textile Institute.

Experience—Assistant chemist in carpet mill, dye tester in dye plant, research and analytical work in silk dyeing and finishing plant laboratory, plant chemist and overseer of bleaching in surgical dressing plant, assistant chemist in woolen mill. Age 29. Married.

A-B-2

Education—Lowell Evening Textile School, 1917.

Experience—Five years' experience in hosiery dyeing, full fashioned hosiery of silk and cotton and silk, also men's hosiery containing rayon, wool, cotton and celanese. Several years experience in laboratory work. Has also had experience in jig-dyeing of cotton piece goods, slub and top dyeing.

A-B-C-1

Education—Graduate Industrial Chemical Engineer, Pratt Institute—1911.

Experience—One year as plant control chemist, 4 years as laboratory chemist with gas company, 13 years as plant chemist with bleaching, dyeing and finishing plant. (Rayon and cotton piece goods). Formulated processes and put them into plant operation, 1 year as chemist and demonstrator for dyestuff company, 1 year as superintendent colorist with print works printing linen and rayon, 1 year as director of testing laboratory for national dry goods concern.

A-B-C-2

Education—Graduate of Lewis Institute of Engineering of Chicago and graduate of Philadelphia Textile School (Chemistry and Dyeing department).

Experience—Has had extensive experience as assistant chemist and colorist in silk printing, dyeing and finishing; also dyeing raw stock wool; and dyeing and finishing cotton and rayon. Age 30; married; references.

A-E-1

Education—Ph.D., Univ. of Illinois, studied chemical engineering at Columbia, licensed chemical engineer, New Jersey.

Experience—10 years' experience teaching in colleges, subjects included chemical and textile subjects. Has had broad experience in industrial work including experience in testing materials, research and consulting. Will go anywhere; references.

B-1

Education—Educated and trained in chemistry and calico printing in Glasgow, Scotland.

Experience—Has been with large print works as colorist for 13 years producing first class work on cotton, rayon, wool and silk fabrics. References.

B-2

Experience—Boss dyer with one firm for 18 years, divisional supt. at print works for 1 year, in charge of processing and dyeing of cottons and rayons at large bleachery for 6 years. Prefers bleachery in East but will go anywhere. References.

B-3

Experience—Foreman piece dyer for the past 21 years. Can dye the following; celanese, rayon, cotton slacks, wool, silk and mixed fabrics. Has knowledge of finishing and laboratory work.

B-6

Education—Graduate R. I. School of Design.

Experience—5 years in bleachery, 7½ years as assistant dyer, 2 years as boss dyer and 3 years as superintendent of dyeing and finishing. Married, 33 years old. References.

B-7

Experience—Eight years as boss dyer on skeins and ribbons. Over ten years as chemist and head dyer for a large hosiery mill. Experienced on Silk, cotton, rayon and wool in skeins, ribbons, piece goods and all kinds of mixtures. Willing to go anywhere. Not afraid to work or face responsibility. Can handle help efficiently.

B-8

Education—Chemistry and Dyeing Department, Philadelphia Textile School.

Experience—Eleven years experience as chemist and boss dyer on the following: woolen, worsted and cotton yarn; woolen, worsted and union piece dyes on both ladies' and men's wear; wool, cotton, shoddy and mohair raw stock. Age 33, married, will go anywhere. References.

B-9

Experience—Hosiery dyer with fifteen years' experience on high grade silk hosiery; familiar with all types of machines. Age 43, married. Will go anywhere.

B-12

Education—2 years days at N. Y. U. and 3 years nights studying chemical engineering.

Experience—1½ years asst. colorist, 5½ years colorist. Experienced on vats, commercial and fast colors on cotton and cotton-rayon mixtures. References; age 29; married.

B-13

Experience—Large experience as an assistant colorist chemist in silk printing, dyeing and finishing; also on cotton and wool dyeing. References.

B-14

Education—Rhode Island School of Design.

Experience—Familiar with all classes of wool dyeing. Seven years with large carpet mill as dyer and processor of washed oriental rugs. Will go anywhere, married, 37 years old. References.

B-15

Education—B.T.C., Lowell Textile Institute, 1934.

Experience—Experience in dye house running washers, dye kettles and as a dye weighter.

F-1

Education—Textile Institute, Alexander Hamilton Inst., Extension work at Brown Univ., working knowledge of German.

Experience—Has had executive departmental work with all types of textiles manufacturers. Acquainted with all types of textile machinery, dyestuff application, laboratory practice, cost methods, and checking methods and processes. References.

APPLICANTS FOR MEMBERSHIP

Active

John L. Isenring—Hosiery Dyer, Eastern Hosiery Mills, Ltd., Truro, N. S., Canada. Sponsors: F. W. Atack, H. D. Roberts.

Harold Vernon Morrell—Chemist, Woodlawn Finishing Co., Pawtucket, R. I. Sponsors: E. H. Gamble, R. R. Farwell.

Adolph C. Schneider—Salesman, General Dyestuff Corporation, New York City. Sponsors: H. F. Herrmann, G. H. Alpers.

Junior

Mrs. Caddy G. Herrick—Research Chemist, Gold Dust Corporation, Baltimore, Md.

Associate

Frederic L. Babcock—Editor, Fibre & Fabric, Cambridge, Mass.

Gerold M. Coté—Assistant Chemist, W. C. Durfee Co., Inc., Boston, Mass. Sponsors: W. C. Durfee, H. P. Selya.

Student

R. Z. Farkas—Lowell Textile Institute, Sponsor, L. A. Olney.

G. W. Hakanson—Lowell Textile Institute. Sponsor, L. A. Olney.

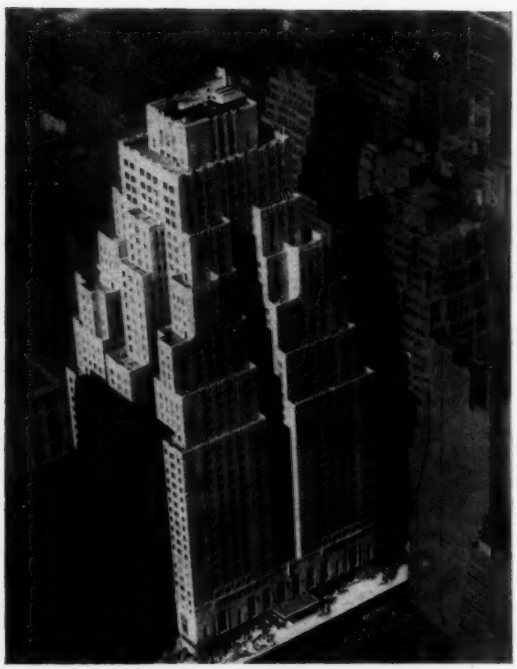
CALENDAR OF COMING EVENTS

Meeting, New York Section, Chemists Club, New York, N. Y., October 26.

Meeting, Philadelphia Section, Penn Athletic Club, October 26.

Annual Meeting and Convention, New York, N. Y., December 7 and 8.

ANNUAL MEETING AND CONVENTION



THE HOTEL NEW YORKER

largest and tallest of New York's skyscraper hotels, where the American Association of Textile Chemists and Colorists begins its convention Dec. 7th. The New Yorker is forty-three stories tall and has five floor levels underground. With 2500 guest rooms, the New Yorker is so large that a convention, even a large one, creates hardly a ripple in the smooth flowing course of its operation. Its accommodations range all the way from very moderately priced single rooms to very luxurious suites. The Grand Ballroom and the North Ballroom, both of which will be used by the Association on various occasions during the convention, are on the second floor, on the north and east sides of the building. The New Yorker has four restaurants, including the Manhattan Room, one of New York's most famous cocktail rooms, and the Terrace Restaurant, where Ozzie Nelson and his orchestra play nightly for dancing until 3 a.m.

COMMITTEES

Committees have been appointed and the names of the members will appear on this page shortly.

ON December 7th and 8th, the New York Section will act as host for the Fourteenth Annual Meeting and Convention of the American Association of Textile Chemists and Colorists.

The various committees are not sparing any efforts to make this a thoroughly enjoyable affair for all who attend. A fine program of technical papers is in process of preparation and the entertainment features for this year promise to surpass anything to which the members have become accustomed.

Plan your work now so that you will be present in New York at that time.

DECEMBER 7th and 8th

NEW YORK CITY

HEADQUARTERS

HOTEL NEW YORKER

AMERICAN
DYESTUFF
REPORTER

LOUIS A. OLNEY, Sc.D.
Professor of Chemistry and Dyeing, Lowell Textile Institute
Directing Editor

NORMAN A. JOHNSON
Managing Editor

MYRON DREW REESER
Advertising Manager

Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

A. P. HOWES
President

M. D. REESER
Secretary

H. F. CRAWFORD
Treasurer

Subscription price: $5.00 per year; Canadian $5.80 foreign $6.00

Vol. XXIII October 22, 1934 No. 22

FAIR PROFIT

THERE is no question about the meaning of the word "profit" but there does seem to be some dispute about what is meant by the term "fair profit." In discussing profits President Roosevelt made reference to "those obligations to the public interest which rest upon us all." Since making the above statement the cotton garment industry has been ordered to shorten its working hours without reducing wages. To interpret this action we must take for granted that the cotton garment industry, in the opinion of the President, was making more than a fair profit and were not properly discharging "those obligations to the public interest" mentioned above. This interpretation, however, is only a guess as neither the President nor his advisors have given any indication to date as to just what may be construed as "fair profit."

It appears now, however, as if we will have some such indication in the near future in view of the report of the Federal Trade Commission which will be due in a few weeks. This commission was ordered to make an investigation into the economic condition of the textile industry as one of a number of conditions leading to settlement of the recent textile strike. The National City Bank has reported that for the first half of 1934, textiles as a group showed an earning profit of 5.8 per cent. Four thousand questionnaires have been mailed out to cotton, woolen, rayon and silk mills inquiring into profits, investments and labor costs. The results of these questionnaires are expected to show which branches of the textile industry are above this 5.8 per cent, which are below, and which have shown a loss.

The findings of the Commission through these questionnaires may have an important bearing upon future wages as, we are told, they will indicate whether or not wages can be raised under existing conditions in the textile field. Furthermore the President's future actions based on the report of the Commission will indicate, it is believed, just what profits the administration will consider as reasonable and fair.

In further regard to profits, Donald R. Richberg, director of the Industrial Emergency Council, has reported to the President a rise in profits (for all industries) from —6.9 in the first quarter of last year to +33.2 in the second quarter of this year. This, Mr. Richberg would indicate, is an accomplishment of industry guided by the NRA. Others probably believe that this has been accomplished in spite of the NRA. We will not discuss this phase of the subject now but it is at least encouraging to find someone who can report an increase in profits.

No matter what the Administration shall set as a figure for "fair profits" there is bound to be dissension from one source or another. Too low a figure will tend to destroy private industrial initiative and too high a figure will arouse the ire of the labor interests. Just where the happy medium lies, that will satisfy both interests, is hard to determine but possibly after several readjustments a point may be reached which is mutually acceptable.

ANNUAL MEETING

WE HOPE to publish shortly the program for the Annual Meeting of the American Association of Textile Chemists and Colorists. However, according to Chairman Freedman, of the New York Section, speaking at its September meeting, "a very active and energetic committee has been appointed, and it is functioning well . . . we would like you all to bear those two days (December 7th and 8th) in mind because there will be some very interesting doings at the New Yorker."

ANNUAL MEETING

AND CONVENTION

A. A. T. C. C.

December 7th and 8th

Hotel New Yorker New York City

● RESEARCH ON TEXTILE FINISHING

Dr. Edward R. Weidlein, Director, Mellon Institute of Industrial Research, Pittsburgh, Pa., has announced that the Onyx Oil & Chemical Company, 15 Exchange Place, Jersey City, N. J., has founded an Industrial Fellowship in that institution. This Fellowship, whose incumbent is Dr. Robert N. Wenzel, is concerned with the scientific investigation of problems in textile processing and finishing.

Dr. Wenzel has been an Industrial Fellow of Mellon Institute since 1927. He received his A.B. at Stanford University in 1916 and his Ch.E. the following year; subsequently, in 1928, after serving as a research chemist at the Monsanto Chemical Works (1918-1922) and after five years of teaching at Stanford, he was awarded the degree of Ph.D. by that university. He is a specialist in organic chemistry who is best known professionally for his comprehensive studies of fatty acids and related compounds.

In his investigations for the Onyx Oil & Chemical Company, Dr. Wenzel will have the close cooperation of the textile specialists on the Institute's research staff. At present the Institute has five different Fellowships in the field of textile technology.

● DYE IMPORTS

Imports of coal tar dyes into the United States in September showed little change from the preceding month or from September last year, though the tendency for Switzerland to supply a greater share of the American import demand continues, according to C. C. Concannon, Chief of the Commerce Department's Chemical Division.

The value of such imports in September totalled $430,430 compared with $489,000 for the preceding month and the quantity declined slightly from 301,200 to 282,500 pounds. Since the beginning of 1934 imports have remained approximately the same in value as for the first nine months of 1933 — $3,551,000, a decline of only $10,000—but the quantity has decreased from 3,350,000 to the 2,407,000 pounds. Browns were prominent among September imports.

Imports of aromatic chemicals in September amounted to 3,300 pounds, valued at $6,800, a considerable increase over the two preceding months. Imports since the beginning of the year have amounted to only 20,000 pounds compared with 31,000 for the first three quarters of 1933.

Receipts of medicinals, photographic developers, and other coal tar products declined in September and for the first nine months of the year were valued at $1,345,000, at an average invoice price of $1.00 per pound, compared with 1,416,000 pounds, valued at $880,000, for the corresponding period of last year, it was stated.

Exports of coal tar and its products during the first eight months of 1934 were valued at $9,155,000, an increase of 20 per cent over the corresponding period of the preceding year. Of this total, colors, dyes, stains, and color lakes, of coal tar origin accounted for $3,948,000, representing a gain of more than 34 per cent in value, and the quantity rose 11 per cent to 13,715,000 pounds. China continues an outstanding market for American dyes, Mr. Concannon stated.

● RECORD ENROLLMENT

Registration of upper classmen on September 19 formally opened the fall session of the Textile School of North Carolina State College with the largest enrollment in the history of the School. Three foreign countries, Canada, Bulgaria, and Turkey, and more than 15 States ranging from Massachusetts to Texas and the Middle West, are represented by students. Over 80 per cent of the students registered are North Carolinians, more than one hundred towns being represented by one or more students.

Included among the new students are a number of men who, after attending other colleges, have decided to prepare themselves for service in the textile industry. Several of these men have received degrees from academic institutions while others have attended such schools for one, two or three years.

● QUARTERLY PRICE LIST

The R. & H. Chemicals Department of E. I. duPont deNemours & Co. has sent out its quarterly price list for October, 1934. Among the new listings are Hexachlorethane—a solid chlorinated hydrocarbon which sublimes at 185°C. and Sodium Monoxide—a powerful desiccant which is highly reactive and a super caustic.

● RAY TEX

Ray Tex, a new finishing soap, is the subject of an attractive folder distributed by the Ray Tex Chemical Co. of Reading, Pa. Included with the pamphlet is an offer to send free samples to interested persons. Copies of this folder are available upon request.

● SYNTHETIC ORGANIC CHEMICALS

The above is the title of a booklet issued by the Carbide and Carbon Chemicals Corp. and is a summary of its products. Included in the booklet are the following subjects: Table of Properties of Chemical Products, Solubility Table, Alcohols, Glycols, Alcohol-Ethers, Ethers and Oxides, Aldehydes, Ketones, Esters, Acids and Anhydrides, Chlorinated Compounds, Amines, Vinylite Resins, Activated Carbon and Hydrocarbon Gases. Copies are available on request.

1884-1934 Society of Chemical Industry in Basle

JULY 1st, 1934 marked the end of the first fifty years of existence of the Society of Chemical Industry in Basle (Ciba), for it was on the first of July, 1884, that the present company was organized and began its first financial year. In commemoration of the event the Society has prepared an attractively bound volume of 85 pages which records the history of this company from the time of its inception.

Mechanically, this book is one in which the Society may take a great deal of pride. The large type used in the printing is especially readable and there are a number of black and white sketches which add materially to the attractiveness of the volume. In addition there are several color plates which, due to an unusual and distinctive treatment, give indications of a great deal of thought in the manner of presentation.

Especially interesting did we find the historical notes concerning developments which preceded the actual formation of the Society. Here we are taken back to the year 1840 when Alexander Clavel came from Lyons and acquired Oswald's silk dye house which was located in the Rebgasse. Clavel had spent many years in the silk industry and this experience caused him to decide in 1859 to enter the coal tar manufacturing industry which was then in its infancy. Through a relationship with the proprietor of Renard Freres & Franc of Lyons he was enabled to obtain information concerning fuchsine manufacture and he further acquired the azalein process which led to a new method for manufacturing fuchsine. In 1860 two chemists were engaged to work on dyestuff manufacture and the new colors were produced very rapidly. This production was stimulated largely by the demands of Clavel's own dyeing business but there was also a good demand from the other dyers in that section.

Because of neighborhood objections to the effect of chemicals on the soil and water Clavel was forced to suspend dyestuff manufacturing operations on the site he then had and moved to a spot located between Klybeckstrasse and the Lower Rhine Way. Later similar objections were raised in this location but things were finally smoothed over and the Society is still located at this site.

Clavel's silk dyeing business prospered to such an extent and technical difficulties were continually annoying him so that, in 1873, he disposed of the dyestuff manufacturing business to Messrs. Bindschedler and Busch. Under their management the company grew steadily which, in turn, called for an increased amount of capital expenditure. As a result they decided in 1884 to form a limited company which is still known today as the Society of Chemical Industry in Basle or more commonly, as "Ciba".

The next portion of the book deals with the scientific and technical developments of the Society and here we learn that the growth of the Society was more or less coincident with the development of the coal tar industry as a whole. An account is given of the condition of the textile industry and dyestuff manufacture in other countries such as England, France, and Germany as well as in Switzerland. Previous to 1890 there were many important developments recorded which included improvements in the dyeing and printing processes, development of alizarine shades followed by the synthesis of alizarine and indigo, production of new basic and acid colors to replace alizarine, discovery of new intermediates, discovery of a new group of azo derivatives which dyed cotton directly and eventually an almost complete line of coal tar dyestuffs to replace the natural coloring matters.

During the next period of development we are informed that the Society spent most of its efforts in further improving the fastness of azo dyestuffs. This led to several important discoveries. Among them were the first red dyestuffs which were capable of being diazotized and developed. Our readers will readily recognize the importance of this step forward. These colors were marketed under the name of Rosanthrenes. Previous to this time a series of acridine derivatives marketed under the names of Patent and Brilliant Phosphines were produced and found application in the calico printing industry and in leather dyeing. A new method for the production of indophenol brought about the production of a line of sulfur colors which have now become familiar as Pyrogene and Thiophenol colors.

We need not emphasize the importance of developments since 1905 in the production of a range of vat colors. Intensive research resulted in the introduction of the indigoid series which gave us this range. Extensive applications were found for this class of dyestuffs and indigo has been surpassed entirely. 1907 witnessed the introduction of the anthraquinone vat colors which were known as Cibanones. This group has been constantly enlarged through the discovery of new syntheses. The group which we now know as the Neolans include a range of about 40 different types and represent an improvement of the original azo dyestuffs. Other colors added included the Lanasols, a class of dyestuffs for wool which are distinguished by excellent fastness to light and washing; Chlorantine Fast Colors, which are metal containing direct colors; Cibacets, which are especially designed for the dyeing and printing of acetates; Fullacines, for wool dyeing and a new range of colors known as Rigans. The most recent addition of colors is in the field of the Naphthols and included are a number of new patented products.

(Continued on page 604)

The Foreman Dyer

His Past, Present and Future

By **E. F. MANOR**

INCREASE of variety has been one of the very serious factors with which recent dyers have had to contend. We remember an old dyer telling us of the golden days away back in the 'sixties, 'seventies, 'eighties of last century. Where he worked there was a regular trade in cochineal scarlets—scores of pieces per week. They were dyed —scarlet—and sent into the warehouse. Some would be on the pinky side, some on the orange or fiery side. For any one delivery they would get, say, all those that were pinky. For the next they would choose those that were fiery. As long as each delivery consisted of pieces approximately alike it was satisfactory. Nowadays, those pieces would be required in perhaps 50 different shades, with perhaps three or four pieces to a shade, each shade to be matched perfectly.

This represents a portion of an article published in *THE DYER* for August 17, 1934 and is reprinted at the request of one of the readers of the REPORTER. While this article of course has a background of conditions as they exist in the British Isles, it is nevertheless applicable in most ways in the United States and will undoubtedly prove of interest to many of our readers.

Matching Problem Reaches a "Crazy Pitch"

This gives some idea of the development of the matching-off problem. In many sections of the trade it has got to a crazy pitch. Quite a large portion of some dyehouses' trade is in lots of literally retail size. In the case of the cochineal scarlet trade just mentioned, that large output of pieces was only part of one man's job—and easily done at that. The same quantity of pieces in the ridiculously small lots now common would keep two foremen at least very fully occupied. Matching to shade is nowadays an occupation requiring very careful personal attention, and there is a tendency to narrow down jobs to a size where one foreman can give this meticulous attention.

What Is a "Foreman Dyer"?

In a small dyehouse—such, for instance, as part of a small factory doing spinning and/or weaving—one foreman may superintend everything—scouring, dyeing, patterning, testing, etc. Or a foreman and assistant may be employed. In larger dyehouses, there may be foremen of departments, perhaps according to color—the black dyer, the indigo dyer, etc., or according to the material—the yarn dyer, the piece dyer, etc. Coordination would be made in the old days by a works manager, or perhaps by the proprietor or his sons. Thus the term "foreman dyer' might connote anything, from a professional dyer controlling the whole dyehouse to a sectional foreman of a few pans or machines. Then into a trade worked under such a medley of arrangements entered another factor—the professional chemist. This gives birth to the problem of dyer and, or versus, chemist which has led to much acrimonious discussion and is not settled yet—though the natural evolution which will lead to its settlement is fairly obvious, as will appear presently.

Chemist's Strategic Position

Unlike those of a sectional foreman dyer, the chemist's activities would be all over the place. If the dyehouse were part of a factory carrying on other activities, e.g., spinning or weaving, there would be work for him to do in those other sections also. Obviously, under every arrangement, the chemist would occupy a very strong strategic position. He would test all dyes and chemicals, and processing liquors. When anything went wrong, he would be needed to find out both cause and remedy. He would be expected to make recommendations for improvements in processing, and to introduce new processes, this meaning that he would have to superintend the first bulk trials. It was inevitable that such a chemist, especially if a University degree man, would have more kudos than an ordinary sectional foreman dyer. Only where a foreman dyer was in full control as works manager and was competent to supervise the work of the chemist would he remain top dog. In such circumstances, the chemist would do routine work to the foreman dyer's instructions. But then this practically supposes the foreman dyer to be

something of a chemist himself. We here see the obvious line of evolution showing itself.

In filling a vacancy for works manager by promotion from the staff, the chemist would probably be a more suitable person than one of the sectional foremen dyers. He would probably be a worse matcher-off than any of them, each in his own circumscribed area, but he would be a better coordinator. But would he be a dyer? Would he not be an even better coordinator if he had had some actual experience of doing dyeing, i.e., matching to shade of bulk lots? Assuredly—and this makes another little point in regard to the evolution just mentioned, and to which we will revert again in a moment.

Although a chemist, especially a degree man, may have more kudos than a foreman dyer, it must be emphasized that a matching-off dyer is a very specialized specialist. That is, he is a specialist in one small area—the department in which he works. It is well known (and some remarkable facts on the matter were made public in a recent case in the courts) that a dyer going to a new place may take a long time to settle down, and may spoil hundreds of pounds' worth of goods before getting the hang of his new job. This applies even to the experienced man who has proved his worth in his previous position.

Experience the Only Way

Every job has its own little peculiarities which can only become familiar by experience, often bitter experience—quality of the water, layout of the plant, special requirements of the new trade. On scores of points, only actual experience can find out the necessary adjustments. In other words, for any job, a man can only be fully qualified by experience *of that job*. We come back once again to those blessed words—"fully qualified."

Undoubtedly, scientific training will enable a man to be more alert to new difficulties and how to overcome them than a mere rule of thumb experience. The instincts of the old job may be misleading in the new one. A man who has become very good in a job has become so largely because his memory has been stored with the numberless facts in connection with it, and his matching off is conditioned by his experience. But in the new job, there is not exact correspondence between his old experience and his new conditions. Till that correspondence is achieved, his matching off will suffer, and till then he will lay himself open to the charge of being incompetent and not fully qualified—and may be dismissed as a dud and have somebody writing to the papers about him. A succession of "duds" may be necessary before the firm becomes fully qualified to understand that a new man must have time to settle down.

A firm may raise its foreman dyers from the apprentice stage. The lads begin their experience practically as laborers, and the knowledge of the idiosyncrasies of a particular plant and job is instilled into them during a period when they are not in charge themselves, but in the hands of an experienced man. If the foreman dyer leaves or dies then they take hold, familiar with the plant and the work.

Blind Alley Jobs

One serious aspect of such an arrangement, and indeed of most foremen dyers' jobs nowadays, is that the jobs are blind ends. The experience of a foreman of a department is of such value to the firm that employs him, and it is so costly and so troublesome a job for a successor to get used to the work, that the inducement to keep a man in that job is very great. If the post of works manager falls vacant, a sectional foreman dyer is not likely to be promoted.

This is a point to be watched by parents when placing their sons in life. Put a lad as an apprentice to dyeing, and a blind-alley job will probably be the most he will achieve. Make him a works chemist, and he may rise to be works manager. But if you want him to have a chance of becoming general manager—perhaps of a big combine—get him launched as a boy in the office—or even in the warehouse. From here he can develop into a "traveller" or "market man" and will become familiar with the customers. When there is a vacancy for general manager, the man who is familiar with the customers will have a better chance than the inside or works manager, and far better one than the foreman dyer hidden away in his blind alley.

Technical Expert Held Down to His Job

This is one of the fruits of the individualistic competition system. A technical expert's job so fully absorbs his time and energies that it holds him down to it. Unless circumstances are very kind to him, he does not get the experience that will enable him to take charge of the commercial side of the business. A technical expert has an arduous apprenticeship, and when he is through with that he has continually to go on learning in order to keep himself up-to-date. An employer's son has the chance to get an all-round training, both on the technical and the commercial side of the business—and sometimes takes advantage of his chance. But the mere technical expert, without circumstances or influence in his favor, has very little chance of extending his experience to the commercial or technical field and only rarely does he reach the highest posts. He has to play second fiddle to the commercial men. The effort and self-denial implied in learning his job and keeping himself up-to-date is out of all proportion to what is necessary for the commercial side—and on the average the reward is in inverse proportion.

Office Versus the Works

Perhaps, as technical science becomes more and more advanced, technical experts will have an increasing market value compared with commercial men. But we are afraid this will not be so. The strategic position of the office against the works is very strong. The business has its

headquarters in the office. Commercial men can always hire technical experts—the reverse case is a very rare one.

The ideal arrangement would, of course, be to have the chiefs of a business doubly qualified, i.e., they should be both technical experts and commercial experts. The thing which militates against this is its practical difficulty—it almost necessitates supermen. In actuality, a compromise is effected. The head of a big concern may be an expert on only one side—either technical or commercial. But he will not be an entire ignoramous on the other side—though it is sometimes surprising how ignorant on technical matters a director of a business can be.

A common working compromise is for each director to be an expert in his line, but it is too common for a board of directors to be preponderatingly commercial, and to include only a small minority of technical men. It may be plausibly argued that one of the reasons why England has relatively lost ground in manufacturing lies in the fact that commercial experts have had more, and technical experts less, than their due share in the control of factories—as against foreign countries where the balance has been better kept. This was particularly true of the dye-making industry. Under ordinary conditions of business, the scales are weighted against the technical expert in the matter of directorships and managerships. How and why this is so is understandable, but it is neither fair nor ideal, and one of the problems of industry is to make a better adjustment.

Naturally, the keenest men direct their energies—and their sons—to where status and rewards are highest, especially when it is actually easier to get and to keep the more highly rewarded positions than the less rewarded ones, as it is in the case of commercial positions versus technical ones. Perhaps no profession has suffered from this tendency more than that of dyeing.

The Big Firms' Mistake

In the old days, the dyer was the possessor of a valuable "mystery," and even for a foreman dyer the monetary reward was very good. Also, in those days it did not require a great amount of capital to set up in business and so secure the reward of both technical expertness and commercial aptitude. But it has become increasingly difficult for a foreman to set up for himself and, as we have seen, the tendency has been towards making foreman dyeing into a blind-end profession. Big firms and combines have not given foremen dyers as much chance of promotion to managerial duties as they ought to have done—as indeed a wiser policy would have led them.

The trade has demanded higher skill of the foreman dyer, while at the same time it has hampered his ambition. It has even restricted him by the illogical introduction of "the chemist"—we say illogical because the procedure has perpetrated a difference in name and even in function where there should have been none—the functions ought to be combined in the same person. As the fact of the reduction of status has become known, fewer have entered the profession, and now we are hearing the cry of lack of fully qualified men. We are brought once again to the question of what constitutes a fully-qualified dyer, and to the allied proposition, entailed in the statement of one correspondent to *The Dyer,* that there is no society of dyers which can claim that membership of it constitutes a guarantee of being "fully qualified."

The presumption entailed in the statement is that such a society is possible, or at any rate that some authority could be set up that, by means of tests of some sort, could put a hall-mark on a man as fully qualified. We submit that the proposition is not so possible of achievement in practice as the correspondent seemed to think—nor as those firms seemed to think who applied to a pedagogue for "fully qualified men" straight out of his class rooms. The reasons for this, put briefly, are that there is too much diversity in the trade for any one standard of efficiency—therein lying such a difference of comparison that the dyeing trade cannot properly be compared with those trades which the correspondent probably had in view when he made his suggestion.

Difficulty of "Qualifying" a Dyer

The Pharmaceutical Society, for example, has the legal right to "qualify" men for the commercial practice of pharmacy. It stipulates that a youth has to serve an apprenticeship, which must entail 3,000 hours' practice in making up prescriptions. Then he must spend a certain time at certain specified schools of pharmacy and pass certain examinations—after which the youth or man is "qualified" as a dispensing chemist. Is anything like this possible in the dyeing trade? It is not. All pharmacists have the same trade. There are no divisions among them to correspond to wool, cotton, silk, rayon, jute, etc., in the dyeing trade, or even to hank, warp or piece dyeing in regard to any one fiber. Would a "fully qualified" wool dyer therefore be a fully qualified cotton or silk dyer? He would not. The diversity of the trade is such that nothing like an approach to uniformity is possible.

Undoubtedly however, a school course of dyeing could be given that would cover the whole range of textile dyeing, so that a man in any one branch of the trade could know the science of the whole of the trade—up to a point that would enable a degree to be given. Such a Tinctorial or Dyeing B.Sc. would then be considered as at least one essential item of the qualification of a "fully qualified" man.

(To be continued)

DYERS ATTENTION!
Attend the
ANNUAL MEETING
A. A. T. C. C.
December 7th and 8th
Hotel New Yorker New York City

Pitted Needles, Sinkers, etc., in Full-Fashioned Hosiery Machines

Increasing Demand For "Ringless" Hosiery Focuses Attention Upon This Problem

By **B. L. HATHORNE**
Textile Consultant and
GEO. A. URLAUB
of Louis Hirsch Textile Machines, Inc.

NOW that ringless hosiery has passed through the experimental stages and into almost a production necessity, it becomes necessary for full-fashioned hosiery producers, throwsters preparing silk for ringless hosiery, and oil manufacturing firms to look again into the problem of pitted needles and sinkers on full-fashioned hosiery machines.

It is now generally accepted that the cause of the recent epidemic of pitted needles and sinkers on full-fashioned machines was due to water* and to changes in the soaking oils used by the industry to prepare silk for knitting, many of the changes being made at the time of the introduction of the so-called "Grenadine" and other high-twist silks.

It was at that time found that changes in soaking formulae materially assisted the running properties of the high-twist yarns. Subsequently, it developed that certain of these changes caused serious pitting of needles, sinkers and knocking-over bits in many plants due to the action of acid on these machine parts.

In most cases the acid was found to be free fatty acid from the soaking bath, that is to say free fatty acid that was not saponified even though excess alkali was present in the soaking bath. Other sources of acid and materials that produce acid during storage were also found. Certain mildew proofing compounds were the worst offenders of this type.

Unfortunately, some of the improper practices and soaking formulae that have gradually crept into the industry have not yet been generally recognized as being dangerous from the viewpoint of the machine itself, presumably because some of these changes have been beneficial in other directions. However, the damage that can be done by pitted needles and sinkers is so great, as is the cost of replacing, production loss, etc., that we believe it wise to stress at this time that soaking baths should be changed only after the possible effect of the changes on the machine itself have been given most careful consideration.

Many mills have found it necessary to change their soaking formulae in order to produce the best results in the production of "ringless" hosiery. Other mills will find it necessary or desirable to make similar changes in the near future. At the risk of repeating to a considerable extent information already made available to the industry, in the article "Pitted Full Fashioned Sinkers, Needles, Bits, etc." by B. L. Hathorne in the April, 1933 issue of the "Melliand," we will briefly summarize herein the work that preceded the writing of that article, together with additional work that has been done on the same problem since that time.

When the problem of pitted needles and sinkers first became important to the industry (shortly after the introduction of the so-called "grenadine" and other high-twist yarns) there were obtained from a great number of mills scattered throughout the country and Canada, samples of the pitted parts and samples of nearly every ingredient coming into contact with the yarn prior to knitting, and with the machine during the knitting operation. Detailed study of the situation resulted in very definite proof that the fault was due to acid in every single instance, although the source of the objectionable acid proved to be quite different from individual case to individual case.

During the ensuing year a series of experiments, including a very elaborate ageing test, definitely proved beyond the shadow of all doubt that neutral and slightly alkaline materials of the sort necessarily used by the full-fashioned industry, could be brought into continuous contact with the full-fashioned machines without danger of injury to stockings knit with the faulty parts, whereas free acid—regardless of its source—invariably caused trouble after sufficient lapse of time.

It was also found that it was not sufficient to ascertain

*This report is concerned with the effect of changes in soaking formulae on needles and sinkers. Though we do not go into detail here regarding the effect of water, we wish to point out that water is a factor.

by test that the soaking solution was on the alkaline side and that the soaked silk was alkaline, but that it was further necessary to make absolutely certain that all of the ingredients used in soaking—and therefore, coming into contact with the silk—were of such a nature that the silk does not contain free fatty acid after soaking or materials that can slowly oxidize during storage to form free acid. We wish to point out that a soaking bath often tests decidedly alkaline and yet contains appreciable quantities of unsaponified free fatty acid.

Full-fashioned hosiery manufacturers will find it wise to test their silk for its effect on needles and sinkers. One simple test that can be utilized by any manufacturer is:—Wind thrown silk around new clean sinkers and place in a tighlty corked test tube, placing the test tube in a warm place—for example, near a radiator—and observing the condition of the sinker from time to time. A "blank" can be run by winding another sinker with raw silk or with silk treated with an oil known to be non-acid and non-productive of acid during storage.

Ageing tests, in which several hundred materials and combinations of materials were tested over a six month period, produced some really astonishing results that will bear repetition here. For example: One material that is today freely used throughout the industry, absolutely dissolved two entire sinkers during a six months period in a tightly sealed test tube. In another instance, an oil combined with the prescribed quantity of alkali caused pitting within three days time.

A more recent detailed series of experiments, both in the laboratory and in hosiery manufacturing plants, utilizing a group of oils especially prepared to meet this condition has resulted in positive proof that certain oils that are now available to the trade completely remove the danger of pitting of needles and sinkers due to soaking bath ingredients.

We cannot too strongly emphasize the need of carefully examining silk specially thrown for ringless hosiery or silk thrown with new soaking emulsions for its effect on needles and sinkers. Proper testing at the outset will prevent a repetition of the unfortunate epidemic of pitted needles and sinkers that accompanied the introduction of special soakings for Grenadine, "compensene", high twists, etc.

● GENERAL RELEASES

The General Dyestuff Corporation has released circulars on the following products. Copies of these bulletins are available on request.

Diazo Indigo Blue B R A Extra—which produces with beta naphtol a bright shade which, it is claimed, will discharge easily and has very good fastness properties.

Algosol Printing Violet I R R—a reddish violet shade which is claimed to be very stable, an easily soluble vat product, very fast to light, washing and chlorine and which is especially recommended by the distributors for printing and padding.

Algosol Violet A R R—a new brand of the Algosol series, which is said to produce bright reddish violets of good fastness properties. It is claimed that on account of its excellent levelling and penetrating properties it is especially recommended for piece goods of cotton, mercerized cotton or rayon on the jig or padder.

Palatine Fast Yellow E L—a new brand of the Palatine Fast colors which is said to be distinguished by its very level dyeing properties. Dyed in the usual way from a strong sulfuric acid bath, or from a weaker bath if Palatine Fast Salt O Solution is used, it is said to produce full reddish shades of yellow which have good fastness to light, washing, perspiration, water and salt-water. In fastness to milling it is said to meet the requirements of a light and medium fulling. It is especially recommended by the distributors for the producing of combination shades on carpet and knitting yarn, and for piece goods for men's wear and better grades of ladies' dress goods. Effects of cotton, rayon and acetate are said to be left perfectly clear and the color will discharge to a clean white with Rongalite C.

Oxydiaminogen O T A—when diazotized and developed with Developer M T is said to yield a jet black shade of very good dischargeability.

Indanthren Brilliant Green GG Extra Paste Fine—a new homogeneous dyestuff which yields considerable yellower shades of green than Indanthren Brilliant Green B. It is said to possess great tinctorial strength and excellent levelling and fastness properties. It is said to be well suited for both dyeing and printing.

● NEW LABORATORY

The United States Testing Laboratory has joined with the North American Laboratory in establishing at 1450 Broadway, New York City, a general textile laboratory. As this is in the center of the textile garment district, it is believed that a quick service to the consuming and producing interests will be readily available.

Chemists Attention!

Annual Meeting

A. A. T. C. C.

December 7th and 8th

Hotel New Yorker

New York City

OPEN FORUM

Rules under which this department of the REPORTER is conducted are as follows:

1. Anyone who has a technical problem on which he would like advice may submit it to the Reporter and it will be published in the first available issue.

2. Any reader who feels that he has a solution of the problem may forward his reply to us and if we feel that the reply is suitable it will be published in a succeeding issue.

3. For each such reply published the Reporter will pay a minimum of $2.

4. In case there is more than one answer to the same question, the one covering the subject in the most complete and authentic manner will be published, or if two answers are sufficiently different both will be published. If two answers are considered equally good, the one first received will be given priority.

5. The Reporter will assume no responsibility whatsoever for the accuracy of the answers submitted—it is simply offering a vehicle for the public expression of its readers' opinions.

6. Both the questioner and answerer must send in his complete name and address. When requested we will publish only the initials or other identifying insignia.

Unanswered Questions

17—We are in need of mathematical text books on problems pertaining directly to textile printing but so far have been unable to find anything on the subject. If you know of texts or problems in math. especially adapted to this field, I would more than appreciate suggestions.—**O. E. M.**

19.—In earlier editions of the Open Forum, Question No. 4, inquiry was made in regard to the use of Potassium Permanganate for certain processes of bleaching and dyeing.

Two different answers to this question were published in the May 21, 1934 edition of the DYESTUFF REPORTER. As far as I can observe, neither of these answers refer to the possible use of potassium permanganate in the bleaching of wool material and rayon. I assume that the bleaching of viscose rayon would be similar to the bleaching of cotton, but I am not sure how it would work with acetate rayon. If anyone has unsuccessfully tried to apply it for any of these purposes, I would be interested in learning why it was rejected.

Further replies along this line will be appreciated.

20.—We have experienced partial color destroying action in basic color printing. The goods are folded face-to, and stored. The color destroying action is not uniform, showing bars, streaks, and blotches. When the material is baled this does not happen. Unfinished material does not show this result. No change in formulas over a period of years.—**G. O. Linberg.**

BOOK REVIEW

Handbook of Chemistry. *Norbert A. Lange and Gordon M. Forker. Pages* 1265. *Including Appendix, Mathematical Tables and Formulas by Richard S. Burington. Pages* 248. *Handbook Publishers, Inc., Sandusky, Ohio. Price* $6.00. *Special Price to Teachers and Students.*

We believe that this new Handbook of Chemistry is the largest book of its type devoted principally to the interests of the chemist. In combination with the Mathematical Handbook of Tables and Formulas incorporated at the end, it constitutes a very complete working handbook for the chemist and might well be upon his desk for frequent reference. From a constructional point of view the book is excellent, well bound with waterproof cover with clear type and sufficiently large pages to make legible tables possible.

As explained in the preface, the book is the result of a number of years' experience in the compiling and editing of data useful to chemists. In it an effort has been made to select material to meet the needs of chemists who cannot command the unlimited time available to the research specialist, or who lack the facilities of a large technical library which so often is not conveniently located at many manufacturing centers. If the information contained herein serves this purpose, the compiler may well feel that he has accomplished a worthy task. Even the worker with the facilities of a comprehensive library may find this volume of value as a time-saver because of the many tables of numerical data which have been especially computed for this purpose.

While the principal value of the book is for the professional chemist or student of chemistry, it should also be of value to many people not especially educated as chemists. Workers in the natural sciences—physicists, mineralogists, biologists, pharmacists, engineers, patent attorneys, and librarians are often called upon to solve problems dealing with the properties of chemical products or materials of construction.

L. A. O.

SOCIETY OF CHEMICAL INDUSTRY IN BASLE

(Continued from page 597)

Textile processing has also received attention in late years according to this book and compounds have been produced to meet the needs of this portion of the industry. Neither has textile chemistry been neglected and work is now being carried on in the field of chemically converted cellulose used in the production of novel dyeing effects.

While we have pointed out above the most interesting phases of Ciba's history as far as the readers of this journal are concerned the book also goes into other developments which make up the entire recordings of the Society and include the accomplishments of the pharmaceutical department, manufacturing developments, factories, patents, development of electro-chemical and inorganic chemical departments, branch works in other countries, financial history, commercial development, welfare department, names of members of the Board of Administration and managers.

In connection with the branch works we note that in 1920 the color works of Ault & Wyborg in Norwood and St. Bernard, Cincinnati, Ohio, were acquired in cooperation with Geigy Co. and Sandoz Chemical Works. After initial difficulties improvement in both number and quality of products manufactured has been steady and in 1933 there were employed at Cincinnati 304 workmen and a staff of 48. In planning for the American market the New York Sales organization cooperated closely with the Cincinnati works and good results have been attendant. In addition the Society also has an agreement with the Dow Chemical Co. in Midland, Michigan, to manufacture under license. A number of the Basle patents and special processes in regard to indigoid colors are in operation at this plant. The New York sales organization has also been instrumental in obtaining a large share of the domestic market for indigoids.

In reading this book we are continually impressed with the amazing foresight which has marked the progress of the Society from the time of its inception. Research has ever been an important factor in its success and this fact was readily recognized by those in charge. We congratulate Ciba upon this occasion and especially do we commend them for the publication of this volume which will stand as mute testimonial of their accomplishments for their first half century.

CLASSIFIED

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

POSITION WANTED—By Philadelphia Textile graduate 31 years old, married, protestant. Experience—At present and for past 6 years, boss dyer in large plant using wool, cotton, rayon and acetate fibers; 2 years apprentice learning wet and dry finishing; 1 year apprentice at wool sorting,—also summer work in dyestuff laboratory. Would like position with opportunity for advancement. Write Box No. 832, merican Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

WANTED—Salesman, one who has established trade in the South selling to dyehouses, by manufacturer of oils and finishes. Send complete information with first letter on how long employed in this territory and approximate annual business done, etc. Our employees know of this advertisement. Reply to Box No. 835, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF MARCH 3, 1933, OF AMERICAN DYESTUFF REPORTER published bi-weekly at New York, N. Y., for October 1, 1934.

State of New York, County of New York, s.s.:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Alfred P. Howes, who, having been duly sworn according to law, deposes and says that he is the Publisher of the AMERICAN DYESTUFF REPORTER, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Name of—— Post office address——
Publisher—Alfred P. Howes, 440 4th Ave., New York, N. Y.
Editor—Prof. Louis A. Olney, Lowell, Mass.
Managing Editor—Norman A. Johnson, 440 Fourth Ave., New York, N. Y.
Business Manager—None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)
Owner: Howes Publishing Company, Inc., 440 Fourth Ave., New York, N. Y.
Stockholders:

Alfred P. Howes, 440 Fourth Ave., New York, N. Y.
Mary K. Howes, Utica, N. Y.
Cecile R. Howes, State Line, Mass.
James T. Howes, State Line, Mass.
Derfla C. Howes, State Line, Mass.
N. H. Hiller, Carbondale, Pa.
Louis A. Olney, Lowell, Mass.
Wm. F. Collins, Upper Montclair, N. J.
Derfla H. Collins, Upper Montclair, N. J.
William H. Collins, Montclair, N. J.
Jos. L. Schroeder, Hartsdale, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the months preceding the date shown above is.....(This information is required from daily publications only.)

ALFRED P. HOWES, Publisher

Sworn to and subscribed before me this 1st day of October, 1934.
(SEAL) CAROLINE ESSENBREIS
(My commission expires March 30th, 1935.)